

4.2.3.10 Waste Management

This section summarizes the impacts on waste management at INEL under No Action and for each of the long-term storage alternatives to include the phaseout of Pu storage. There is no spent nuclear fuel or HLW associated with Pu or HEU storage. Table 4.2.3.10-1 lists the projected sitewide waste generation rates and treatment, storage, and disposal capacities under No Action for 2005. Projections for No Action were derived from the most recent available environmental data, with appropriate adjustments made for those changing operational requirements where the volume of wastes generated is identifiable. The projection does not include wastes from future, yet uncharacterized, environmental restoration activities. The projections for No Action could change significantly depending on the decisions resulting from the PEIS on waste management being prepared by the Department. Table 4.2.3.10-2 provides the estimated incremental operational waste volumes projected to be generated at INEL as a result of the various storage alternatives prior to treatment. Some of the waste values described in this section are different than the waste values in the table. For those values that differ (for example, LLW), the table gives waste generated pre-treatment values and the text discusses post-treatment values (indicated as after treatment and volume reduction). The waste volumes generated from the various storage alternatives and the resultant waste effluent used for the waste impact analysis are shown in Section E.3.1. Facilities that would support the storage of Pu and HEU would treat and package all waste generated into forms that would enable staging and/or disposal in accordance with RCRA and other applicable statutes. Depending in part on decisions in waste-type-specific RODs for the Waste Management PEIS, wastes could be treated and disposed of onsite or at regionalized or centralized DOE sites. For the purposes of analyses only, this PEIS assumes that TRU and mixed TRU waste would be treated onsite to the current planning-basis WIPP WAC, and shipped to WIPP for disposal. This PEIS also assumes that LLW, mixed LLW, hazardous, and nonhazardous wastes would be treated and disposed of in accordance with current site practice.

Preferred Alternative: No Action Alternative

Under this alternative, INEL would receive spent nuclear fuel from numerous offsite generators/storage locations, and high-level, TRU, low-level, mixed, hazardous, and nonhazardous wastes would continue to be managed from the missions outlined in Section 3.4. INEL's focus would be to continue the restoration of priority sites and the stabilization of other sites. By the year 2010, much of the existing wastes at INEL would have been treated and disposed of or stored in compliance with existing regulations. The waste treatment activities that are planned to be still in operation are the calcination of liquid HLW and LLW after completion of the processing of special fuels and residuals at the ICPP, the retrieval and repackaging of buried TRU waste, and stabilization of spent nuclear fuel for long-term storage. Under No Action, INEL would continue to store its inventory of Pu and to treat, store, and dispose of its legacy and newly generated wastes in current and planned facilities.

Spent nuclear fuel would be managed in accordance with the ROD published on June 1, 1995 (60 FR 28680) from the *Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement* (DOE/EIS-0203-F) as amended on March 8, 1996 (61 FR 9441). According to the ROD, INEL would ship its existing inventory of aluminum-clad spent nuclear fuel to SRS. In addition, INEL would receive non-aluminum-clad spent nuclear fuel from the Navy, Hanford, SRS, West Valley Demonstration Project, foreign research reactors, universities, and other generators or storage sites. The following INEL spent nuclear fuel projects will be implemented as a result of the ROD: Increased Rack Capacity for Building 666, Dry Fuel Storage Facility, and Expanded Core Facility Dry Cell Project. Decisions regarding other ongoing or planned projects, as it was with the Electrometallurgical Process Demonstration (61 FR 25647), would be made in the future pending further project definition, funding priorities, and appropriate review under NEPA. TRU waste already packaged to current planning-basis WIPP WAC would either be stored or would have been shipped. Mixed waste would have been treated and disposed of according to the INEL Site Treatment Plan, which was developed to comply with the *Federal Facility Compliance Act*. Solid LLW would continue to be buried at the onsite RWMC. Under No Action, the processing of legacy wastes would require new facilities since the necessary treatment, storage, and disposal facilities either do not exist or are nearing capacity.

The Pu addressed in this PEIS is limited to materials currently stored within protected vaults and gloveboxes, and additional materials within process lines and process equipment associated with Pu storage and surveillance facilities. The Pu facilities have been used to conduct Pu processing operations such as Pu purification, Pu recovery, oxide production, metal production, and parts fabrication. The Pu facilities have also been used for receipt and large-scale storage of onsite and offsite Pu, uranium scrap, and product materials. Under No Action, INEL would not be able to maintain the inventory of Pu scrap and metal in a state that provides for long-term storage while awaiting a decision for future disposition. Modifications to the facilities would be required to meet current regulations. Maintenance, assay, packaging, and monitoring of the inventory would produce TRU, low-level, hazardous, and nonhazardous wastes. These wastes would be treated, stored, and disposed of in compliance with existing regulations.

Upgrade Alternative

Upgrade Without Rocky Flats Environmental Technology Site or Los Alamos National Laboratory Plutonium Subalternative

Modify Existing and Construct New Argonne National Laboratory–West Facilities for Continued Plutonium Storage

The upgrading of the existing ANL-W storage facility for the continued storage of Pu would have a small impact on existing ANL-W and INEL waste management activities. Construction waste volumes as presented in Table E.3.1.1–2 would have minimal impact on ANL-W and INEL waste management activities. Waste generated during construction would consist of wastewater and solid nonhazardous and hazardous wastes. Nonhazardous waste would be disposed of as part of the construction project by the contractor, and the hazardous waste would be shipped offsite to commercial RCRA-permitted treatment and disposal facilities. Operational waste volumes as shown in Table 4.2.3.10–2 would increase slightly due to increased surveillance activities over No Action.

Following treatment and volume reduction of TRU waste, approximately 1 m^3 (1.3 yd^3) of solid TRU waste and 1 m^3 (1.3 yd^3) of solid mixed TRU waste from damaged PCVs and contaminated glovebox panels, windows, and gaskets would need to be treated and packaged to meet the current planning-basis WIPP WAC or alternative treatment level. While awaiting shipment to WIPP (depending on decisions made in the ROD associated with the supplemental EIS for the proposed continued phased development of WIPP for disposal of TRU waste), the TRU waste would be stored in above-grade storage facilities in the INEL RWMC and processed in the planned Advanced Mixed Waste Treatment Project. One additional truck shipment every 4 years or, if applicable, one regular train shipment every 9 years or one dedicated train shipment every 25 years would be required to transport this waste to WIPP.

After treatment and volume reduction, approximately 250 m^3 (327 yd^3) of LLW from solidified liquid LLW (such as decontamination solutions), protective clothing, HEPA filters, glovebox gloves, and decontamination equipment and materials would be packaged at the existing Waste Experimental Reduction Facility and would require disposal in the RWMC. Assuming a land usage of $6,200 \text{ m}^3/\text{ha}$ ($3,300 \text{ yd}^3/\text{acre}$), this would require 0.04 ha/year (0.1 acre/yr) of LLW disposal area.

Contaminated shielding and cleaning materials would be the major contributors to the 0.015 m^3 (4 gal) of liquid and 27 m^3 (35 yd^3) of solid mixed LLW. This small amount of mixed LLW could be treated and disposed of in accordance with the INEL Site Treatment Plan through the use of existing and planned facilities.

The 0.15 m^3 (40 gal) of liquid hazardous wastes such as lubricants, cleaning solvents, paint, and lube oil and 1 m^3 (1.3 yd^3) of solid hazardous wastes such as lead packing, wipes, and solid materials contaminated with oils, lubricants, and cleaning solvents would have a minimal impact on waste management activities at INEL. While awaiting shipment to an offsite RCRA-permitted treatment and disposal facility, the INEL Hazardous Waste Storage Facility has adequate capacity to handle this increase.

Approximately 7,600 m³ (2,010,000 gal) of liquid nonhazardous wastes to include sanitary, utility, and process wastewaters, and cooling system blowdown could be handled by the existing Industrial Waste Pond and ANL-W sewage lagoons. After volume reductions, 120 m³ (157 yd³) of solid nonhazardous wastes such as clean non-Pu metals, packing materials, office trash, defective and damaged equipment, and industrial waste from utility and maintenance operations would be sent to the existing sanitary/industrial landfill on the INEL site.

Upgrade With All or Some Rocky Flats Environmental Technology Site and Los Alamos National Laboratory Plutonium Subalternative

Modify Existing and Construct New Argonne National Laboratory–West Facilities for Continued Plutonium Storage

Construction and operation of an upgraded Pu storage facility that would accommodate material from RFETS and LANL would have the same waste management impacts as the same Upgrade Without RFETS or LANL material for all but nonhazardous wastes. The generation of TRU, mixed TRU, and LLW would be the same during operations. While the liquid mixed low-level and hazardous waste generated during operations is slightly higher, it is not significantly different. Therefore, the impacts would be similar.

Approximately 10,300 m³ (2,720,000 gal) of liquid nonhazardous wastes to include sanitary, utility, and process wastewaters and cooling system blowdown can be handled by the existing Industrial Waste Pond and ANL-W sewage lagoons. After volume reduction, 173 m³ (226 yd³) of solid nonhazardous wastes such as clean non-Pu metals, packing materials, office trash, defective and damaged equipment, and industrial waste from utility and maintenance operations would be sent to the existing sanitary/industrial landfill on the INEL site.

Distributing the RFETS and LANL Pu to more than one site would reduce the operational waste volumes. The decrease would be proportional to the amount of material.

Consolidation Alternative

Construct New Plutonium Storage Facility

Construction and operation of a consolidated Pu storage facility would have an impact on existing ANL-W waste management activities by increasing the generation of TRU, low-level, mixed, hazardous, and nonhazardous wastes. Waste generated during construction would consist of wastewater, nonhazardous solids, and hazardous wastes. The nonhazardous wastes would be disposed of as part of the construction project by the contractor, and the hazardous wastes would be shipped to commercial RCRA-permitted treatment and disposal facilities. No soil contaminated with hazardous material or radioactive constituents is expected to be generated during construction. However, if any was generated it would be managed in accordance with site practice and all applicable Federal and State regulations. The types of operational wastes from the consolidated Pu storage facility would be same as those from the upgraded facility, but the quantity would change, as shown in Table 4.2.3.10–2.

After treatment and volume reduction of TRU waste, approximately 5 m³ (7 yd³) of solid TRU waste and 4 m³ (5 yd³) of mixed TRU waste from leaded gloves, windows, and contaminated Pb shielding would be treated and packaged to meet the current planning-basis WIPP WAC or alternative treatment level. While awaiting shipment to WIPP (depending on decisions resulting from the supplemental EIS noted earlier), the TRU and mixed TRU waste could be stored in above-grade storage facilities in the INEL RWMC and processed in the planned Idaho Waste Processing Facility. One additional truck shipment per year or, if applicable, one regular train shipment every 2 years, or one dedicated train shipment every 6 years, would be required to transport these wastes to WIPP.

Following treatment and volume reduction, approximately 630 m³ (824 yd³) of LLW would require disposal in the RWMC. This would require approximately 0.1 ha/year (0.3 acre/yr) of LLW disposal area at the RWMC. The 0.2 m³ (50 gal) of liquid mixed LLW and 65 m³ (85 yd³) of solid mixed LLW would be treated and disposed of in accordance with the INEL Site Treatment Plan through the use of existing and planned facilities. The 2 m³ (476 gal) of liquid hazardous waste and 2 m³ (3 yd³) of solid hazardous wastes would have minimal impact on waste management activities at INEL, as there is adequate storage capacity as noted earlier in the upgrade alternative.

The treatment of 65,900 m³ (17,400,000 gal) of liquid nonhazardous wastes could use existing sanitary wastewater treatment systems, but the construction of utility and process wastewater treatment systems would be required. After volume reduction, 660 m³ (863 yd³) of solid nonhazardous wastes would require disposal at the existing sanitary/industrial landfill on the INEL site.

Collocation Alternative

Construct New Plutonium and Highly Enriched Uranium Storage Facilities

Construction and operation of a consolidated Pu storage facility collocated with HEU storage would have an impact on existing INEL waste management activities, increasing the generation of TRU, low-level, mixed, hazardous, and nonhazardous wastes. Waste generated during construction would consist of wastewater, nonhazardous solids, and hazardous wastes. The nonhazardous wastes would be disposed of as part of the construction project by the contractor, and the hazardous wastes would be shipped to a commercial RCRA-permitted treatment and disposal facility. No soil contaminated with hazardous material or radioactive constituents is expected to be generated during construction. However, if any was generated it would be managed in accordance with site practice and all applicable Federal and State regulations. Because there is no TRU or mixed TRU waste associated with HEU storage, the impacts from TRU and mixed TRU wastes are identical to those identified in the Consolidated Pu Storage Alternative. The sources of waste are similar to those of the upgraded Pu storage facility, except the source of radioactive contamination from the HEU storage is uranium. Operational waste volumes are shown in Table 4.2.3.10–2.

Following treatment and volume reduction, approximately 630 m³ (824 yd³) of solid LLW contaminated with Pu and 20 m³ (26 yd³) contaminated with uranium would require disposal in the RWMC. This would require approximately 0.1 ha/yr (0.3 acre/yr) of LLW disposal area. The 0.2 m³ (55 gal) of liquid mixed LLW and 66 m³ (86 yd³) of solid mixed LLW would be treated and disposed of in accordance with the INEL Site Treatment Plan through the use of existing and planned facilities. The 2 m³ (528 gal) of liquid hazardous wastes and 2 m³ (3 yd³) of solid hazardous wastes would have a minimal impact on waste management activities at INEL, as there is adequate storage capacity as noted earlier in the upgrade alternative.

The treatment of 86,800 m³ (22,900,000 gal) of liquid nonhazardous wastes could use existing sanitary wastewater treatment systems, but the construction of utility and process wastewater treatment systems would be required. After volume reduction, 860 m³ (1,120 yd³) of solid nonhazardous wastes would require disposal at the existing sanitary/industrial landfill on the INEL site.

Subalternative Not Including Strategic Reserve and Weapons Research and Development Materials

The exclusion of strategic reserve and weapons R&D materials would reduce the amount of operational waste volumes shown in Table 4.2.3.10–2 for the Upgrade with All or Some RFETS and LANL Pu Subalternative, the Consolidation Alternative, and the Collocation Alternative. The decrease would be proportional to the amount of material excluded.

Phaseout

The phaseout of Pu storage would have no impact on INEL waste management activities. The quantities of waste would not decrease until D&D in which Pu is stored was completed.